

CLAIMS:

1. A method for sending a notice of failure detection in a system connecting first and second network interfaces incorporated in first and second apparatuses by a line including a transmission side transfer path and a reception side transfer path, wherein:

said first and second network interfaces periodically transmit a utilizability signal representing the failure of said line or an own apparatus to said transmission side transfer line; and

said first apparatus judges an occurrence of a failure when it cannot detect said utilizability signal from said second network interface of said second apparatus as a mating apparatus for a predetermined period from said reception side transfer path, and said first network interface of said first apparatus stops transmitting said utilizability signal to be transmitted to said second network interface of said second apparatus and thus reporting the occurrence of the failure to said second apparatus.

2. A method for sending a notice of failure detection according to claim 1, wherein:

when said first network interface of said first apparatus stops transmitting said utilizability signal, said first apparatus starts transmitting periodically said utilizability signal to said reception side transfer path after the passage of a predetermined period, monitors thereafter whether or not said utilizability signal can be detected on said reception side transfer path, judges that

007060" 68045960

Sub 14

Sub A-4

3. A method for sending a notice of failure detection according to claim 1, wherein:

at least one of said first and second apparatuses includes a plurality of network interfaces as a group, and stops transmitting said utilizability signal from all of said network interfaces inside said group when the failure occurs in one of said network interfaces inside said group or in said reception side transfer path connected to said network interface, and said utilizability signal cannot be detected from said reception side transfer path.

4. A method for sending a notice of failure detection according to claim 2, wherein:

at least one of said first and second apparatuses includes a plurality of network interfaces as a group, and stops transmitting said utilizability signal from all of said network interfaces inside said group when the failure

09611030

when said utilizability signal cannot be detected on said reception side transfer path for the predetermined time, said first apparatus judges that the failure is not restored, stops again intentionally transmitting said utilizability signal that has been transmitted periodically to said transmission side transfer path, starts again transmitting periodically said utilizability signal to said

[illegible]

6. A method for sending a notice of failure detection according to claim 1, wherein the data communication is stopped simultaneously with the stop of transmission of said utilizability signal of said transfer path.

7. A method for sending a notice of failure detection according to claim 2, wherein the data communication is started again simultaneously with restart of transmission of said utilizability signal of said transfer path.

8. A network interface in a system connecting two network interfaces incorporated in two apparatuses, respectively, by a line including a transmission side transfer path and a reception side transfer path, comprising:

a transmission control portion for periodically transmitting a utilizability signal representing a failure of said line or said apparatus associated with said line to said transmission side transfer path from said network interface to the other of said network interfaces; and

a line control portion for stopping transmission of said utilizability signal to be transmitted to said interface, to said transmission control portion by judging that a failure occurs when a reception control portion cannot detect said utilizability signal from the other of said interfaces from said reception side transfer path for a predetermined time.

9. A network interface according to claim 8, wherein at least said line control portion is produced into a one-chip semiconductor integrated circuit.

10. A network apparatus in a network system having one or more network interfaces incorporated in two apparatuses and connected by a line including a transmission side transfer path and a reception side transfer path electrically isolated from one another, wherein:

said network interfaces are classified into groups, at least one of said network interfaces belongs to each of said groups, and a network interface is allowed to belong to a plurality of said groups; and

each of said network interfaces includes means for stopping transmission of a utilizability signal to be transmitted to said transmission side transfer path when a failure is judged as occurring in said reception side transfer path, and means for stopping transmission of said utilizability signal to said transmission transfer path in all of said network interfaces belonging to the same group as said network interface when the failure is detected in at least one network interface belonging to a group

007060" 68045960

Sub A4

Subst
associated with its own network interface.

11. A network apparatus according to claim 10, wherein each of said network interfaces includes means for continuing transmission of said utilizability signal to said transmission side transfer path and starting again simultaneously data communication when the failure of said reception side transfer path is judged as being restored, and means for starting transmission of said utilizability signal to said transmission side transfer line in all of said network interfaces belonging to the same group as said interface when failure restoration is detected after the passage of a predetermined time from the failure detection.

12. A network system having redundant routes of a plurality of systems constituted by using said network apparatus according to claim 10, for cutting off reliably and at a high speed a failure occurrence portion and assisting switching of said redundant routes at the time of occurrence of the failure by setting groups in accordance with a switching unit at the time of the occurrence of the failure.

007050" 68045960